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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/673,581	09/30/2003	Ji-Soo Kim	SEC.745C	1609
7590 05/10/2004 VOLENTINE FRANCOS, PLLC SUITE 150 12200 SUNRISE VALLEY DRIVE RESTON, VA 20191			EXAMINER FERNANDEZ, KALIMAH	
			ART UNIT 2881	PAPER NUMBER

DATE MAILED: 05/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 10/673,581	Applicant(s) KIM ET AL.	
	Examiner Kalimah Fernandez	Art Unit 2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-14 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 9-12 is/are rejected.
- 7) ☒ Claim(s) 13 and 14 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 9-10 are rejected under 35 U.S.C. 102(e) as being anticipated by US Pat No 6,232,787, issued to Lo et al.
3. Lo et al disclose a method of inspecting a microstructure having a conductive layer and overlying insulating layer (col. 8, lines 23-53).
4. Lo et al disclose repeatedly scanning an inside of the contact hole with a beam of primary electrons (col.4, lines 6-9; col.4, lines 23-30).
5. Lo et al disclose collecting secondary electrons that are generated by a reaction between the primary electron beam and an inside surface of the

contact hole and that are emitted from the contact hole (col.2, lines 25-30; col.4, lines 23-32).

6. Lo et al disclose determining whether a surface of the conductive layer (420) is exposed through the contact hole in the insulating layer pattern (410) based on a change in an amount of collected secondary electrons (col.4, lines 23-38; col.8, line 54- col.9, line 6; col.10, lines 11-23). Namely, Lo et al teach determining faults (which essentially means the underlying structure is exposed) from voltage contrast imaging (col.7, lines 39-48; col.9, lines 39-59).

7. As per claim 10, Lo et al disclose a gate electrode having a gate insulating layer thereunder (col.15, lines 60-67).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lo et al '787 and US Pat No 6,091,249 issued to Talbot et al.

10. Lo et al disclose the claimed invention except for counting a number of scans.

11. However, Talbot et al teach repeatedly scanning comprises sequentially repeating transmission of the primary electron beam in a form of a pulse and counting a number of scans (col.7, lines 28-35; col.3, lines 34-48; col.4, lines 6-7). Namely, Talbot et al teach the ability to count (or determining) the numbers of scans as to ensure adequate examination of a feature.

12. It would have been obvious to an ordinary artisan to combine the teachings of Lo et al and Talbot et al since Talbot et al teach the optimization of scanning to acquire reliable, sufficient data (col.3, lines 49-52).

13. As per claim 12, Talbot et al teach comparison of data to reference (col.3, lines 60-63). In addition, Lo et al teach comparison of data to a reference (see col.13, lines 40-43).

Allowable Subject Matter

14. Claims 13-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art of record fails to teach or obviously suggest the claimed invention.

15. Specifically, no teaching or obvious suggestion was found of the limitations “designating the conductive layer as exposed when the waveform of the sample graphs overlaps the waveform of the reference graph; and designating the conductive layer as not exposed when the waveform of the sample graph is separated from the waveform of the reference graph” in combinations with the other recited limitations of claim 13.

16. Similarly, no teaching or obvious suggestion was found of the limitation “designating the conductive layer as not exposed when the waveform of the sample graph is separated from the waveform of the reference graph in an upward direction when the number of scans of the

primary electron beam is no more than 200" in combination with the other recited features of claim 14.

Conclusion


17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Pat No 6,618,850 issued to Nishiyama et al teaches the use of the number of scan in imaging (see col.5, lines 31-41). In addition, US Pat No. 4,745,360 issued to Reimer et al is considered relevant to conventional method of pulsing the electron beam (col.4, lines 44-50).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kalimah Fernandez whose telephone number is 571-272-2420. The examiner can normally be reached on Mon-Tues 6:30-3:30; Wed-Thurs 8-5 and Fri.9am-6 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R Lee can be reached on 571-272-2477. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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